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is becoming detached it appears to annoy ursus, who endeavors to assist the course of nature by tearing it off with his teeth, and then licks the soft sole with his tongue. Perhaps he derives the same pleasure from this that the average boy enjoys in nursing a sore toe, or an elderly party in petting a favorite corn. The nutriment, however, to be derived from this barmecidal feast would be about equal to the amount of blood that could be extracted from a turnip. This circumstance may have given rise to the story. On emerging from his den in the spring the bear is a 'tenderfoot' in the literal acceptance of the word. Those persons who have had the outer skin of the palms of the hands and soles of the feet peeled off after recovering from scarlet fever will keenly appreciate the bear's unhappy condition at this period, and until the soles of his feet become again hardened, he does not travel far from his den, to which place he nightly returns until 'well healed,' and if found before this time becomes generally an easy prey to the hunter, who has the black gentleman at a considerable disadvantage at this particular season. The tappen or plug which seals, so to speak, the intestines of bears during hibernation is not confined to this animal alone, being also found in the racoon (*Procyon lotor*); but on account of its small size in the last-named animal is not so conspicuous, and consequently not so often noticed."—In the Philosophical Transactions of the Royal Society of London, 1880, Dr. W. B. Lewis details the results of an examination into the structure of the cortex cerebri of the pig, sheep, and cat. In the two former these structures are similar, and the ganglionic cells, which in the cat are crowded round the cranial sulcus, are in these artiodactyles widely spread and uniform, while in the quadrumana and man they are widely spread and varied in development.—Dr. Dybowski publishes, in the Proceedings of the Zoölogical Society of London, a note on the sexual differences between the skulls of *Rhytena stelleri*.—Dr. H. Burmeister, the veteran South American naturalist, has just described, under the name *Nothropus priscus*, an extinct giant sloth, twice as large as any now existing, and which probably had the same arboreal habits as the Bradypodidæ of the present day. This form was found in the Pleistocene beds of the Argentine Republic, which have furnished such large numbers of extinct Edentates.

PHYSIOLOGY.¹

THE EXCITATION OF THE VASO-MOTOR CENTERS BY INDUCTION SHOCKS.—H. Kronecker and R. Nicolaides in *Du Bois' Archiv.*, discuss the interesting question as to the strength and rate of succession of electrical shocks which most powerfully excite the activity of the vaso-motor center in the medulla oblongata when the stimuli are directly applied to it. According to present physiological views the natural impulses which proceed from nerve

¹This department is edited by Professor HENRY SEWALL, of Ann Arbor, Michigan.

centers are interrupted and not continuous in character, and it would seem probable that that rate of artificial stimulation which most powerfully excites the action of the nerve center is the rate at which the center naturally discharges its energy. The following are the results obtained during the research in question: Single induction shocks applied to the medulla or spinal cord, when the connection between these and the brain is severed, have no effect upon blood pressure, or only a slight effect, and that when the shocks are destructively strong. When middling strong stimuli were used, there was no summation of their effects until the separate shocks succeeded each other at least two to three times in one second. This slow rate of stimulation produces a greater effect in raising blood pressure when the intensity of the single shocks is increased. But the strongest stimuli of slow rate produce far less increase in blood pressure than stimuli of moderate strength and greater frequency. The most favorable rate of stimulation appears to be that at which the separate shocks succeed each other at intervals of $1\frac{1}{20}$ second. When the intensity remains constant, increase in frequency of stimulation raises blood pressure, but the maximum is reached when twenty to thirty stimuli per second are reached. The maximum effect in any case can be produced either through the application of strong stimuli of the rate 10-12 in one second or by shocks of medium strength 20-25 in a second. The maximum effect upon blood pressure is brought about later by the slow succession of strong stimuli than by the rapid weaker stimulation. After the stimulation is brought to a close the blood pressure returns very gradually to its normal level. Dogs and rabbits were the animals experimented upon.

THE FUNCTION OF THE SPLEEN.—The spleen may be extirpated from an animal without apparently producing any special disturbance; and though, from its periodical engorgement during digestion, it has been supposed to form a functional part of the digestive apparatus, we are by no means certain of its functions in the body.

Herzen comes forward in support of an old view of Schiff's, that there is a close relation between the trypsin, or proteid ferment, producing power of the pancreas and the activity of the spleen. The author makes an infusion of the pancreas of a fasting dog, and finds that it has little or no power to digest proteids, but if the same pancreas be extracted after mixing it with part of the swollen spleen taken from an animal in full digestion, it has great power of artificially digesting proteids. The conclusion arrived at, from varied experiments, is, that during the active, swollen condition of the spleen in digestion, there is produced in it a special ferment, which being transported by the circulation to the pancreas, there sets up changes which result in the partial conversion of the store material of the pancreas into the active proteolytic ferment, trypsin.

THE TUBERCLE-BACILLUS.—In two August numbers of the *Boston Med. and Surg. Jour.*, Dr. Ernst gives an extensive résumé of the literature pertaining to Koch's discovery of the *bacillus tuberculosis*. The author has made inoculation experiments upon lower animals, and he has made careful histological study of a number of human cases of the disease, and concludes that the following statements fairly represent the outcome of all investigations which have been made upon this subject:

"I. A staff-shaped micro-organism exists in all forms of the tuberculous process, and its presence has been demonstrated in them.

"II. It is more abundant in the rapid than in the slow forms of the process.

"III. Its specific nature as the cause of tuberculosis is claimed by Koch on the ground of his observations.

"IV. Its specific character has not been successfully refuted by trustworthy observations.

"V. Its value as diagnostic evidence of tuberculosis is very great, although its absence cannot be considered as excluding that process."

THE FUNCTION OF THE COCHLEA.—In the meeting of the Physiological Society of Berlin, held June 15, Dr. B. Baginsky spoke about the results of experiments which he had instituted in order to determine the function of the cochlea. It is well known that anatomical research has determined that the membrana basilaris of the cochlea, in which the terminal filaments of the auditory nerve are distributed, increases in breadth from the bottom towards the upper part; and Herr von Helmholtz had founded an hypothesis upon this to explain the differentiating perception of certain higher tones, viz., that the sound waves that penetrate into the cochlea occasion a synchronous vibration either in the broader upper half or in the narrower lower half of the membrana basilaris, so that the higher tones would excite the fibers of the auditory nerve distributed in the lower part, and the deeper notes of the fibers distributed in the upper part. In animals which are low in the scale of development there is a similar arrangement, which consists of auditory cilia of different lengths which have the same function, as the shorter ones are intended for the higher notes and the longer ones for the deeper notes and noises, and are set into synchronous vibration by them. This hypothesis has been experimentally confirmed in the case of the auditory cilia of the lower animals, and it had actually turned out true that deep notes produced vibrations in the long hairs and high notes in the short ones. Herr Baginsky now undertook to test the hypothesis of Herr von Helmholtz experimentally on the cochlea of higher animals. After he had succeeded in overcoming the great practical difficulties, he wounded the top of the cochlea of

the healthy ear in dogs which had been made absolutely deaf of their other ear, and then observed their hearing powers by means of the different notes of organ pipes between c and c'''' . On the third day after the immediate consequences of the operative interference had disappeared, it was found that the dogs responded perfectly to the notes c'''' , c''' , c'' , c' , but were deaf to the deeper notes. This condition remained unaltered for weeks, and when the animal that had been the subject of experiment was killed, post-mortem examination showed that the top only of the cochlea had been wounded, and that the filaments of the auditory nerve that were distributed to that portion were destroyed. Less precise were the results of the experiments in which the lower part of the cochlea was destroyed; in these cases absolute deafness occurred in a succession of cases; in other cases again, the dogs responded to high as well as to low notes, to the latter perhaps a little better; and again, in other cases, on the other hand, the dogs only responded to the notes c , c' , c'' , while they were deaf to the higher notes. But this condition only lasted some fourteen days; their hearing power for the higher notes set in again, and soon reached the same sensitiveness as that for the deep notes. Post-mortem examination showed in these various cases different degrees of distinction occasioned by the operation. Herr Baginsky believes that he has by his experiments, in particular by the results of lesion of the top of the cochlea, verified experimentally for the mammalian cochlea the hypothesis of von Helmholtz.—*Nature*.

PSYCHOLOGY.

HABITS OF THE BEAVER.—When I read Mr. Collins's story of beaver life in Nova Scotia during the last shooting season, I was pleased beyond expression. Here was something new, neither old hash nor guess work; here was a picture of inner life, life at home, worth all that had been previously written of the animal. I could almost see him come out in the twilight, look over his ruined house, and then set to work to restore it. I could see him lay and relay the sticks of which it was composed, working till back and shoulders ached, and then sitting up a moment to rest.

But the larger work on the dam just below was missed, a blank in natural history it is our luck to fill out, "acknowledging in, etc.," that the whole merit belongs to a sportsman naturalist, who seems, as you will see, under the circumstances of the case, to have "risen from savage to civilized life." A few days after reading Mr. Collins's narrative, I was agreeably surprised by a visit from an old friend and pupil, George Daniels, who had spent the past summer preparing subjects in the State Cabinet of Kansas. Research for that purpose led him to the adjoining Indian Territory, where he found undisturbed beaver communities among other developments of animal life. Securing three speci-